DOER Program Overview Emphasizing SI and Turtles

National Dredging Meeting, June 14, 2006, Washington, DC

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DOER Details

- Funding Source: O&M remaining Items
- Annual Funding: $6M
- Navigation BL Manager: Angie Premo
- Technical Monitor: Joe Wilson
- Web site http://el.erdc.usace.army.mil/doer

Basis for DOER

- Pressure to end aquatic placement is ongoing
- Costs are increasing
- Environmental standards are becoming more restrictive
- Future engineering and environmental innovation will be essential to keep costs within budget constraints

Basis for DOER

- Risk-based assessment and management has become accepted basis for decision-making
- Maintain corporate technology base
- Beneficial use of dredged material a priority
- Effective technology transfer and application to stakeholders

DOER

- **Objective: Ensure a successful navigation program**
  - **complex economic, engineering, and environmental challenges**
  - **advancing the science and engineering applied to navigation dredging operations**

DOER
- Focus Areas -

- Innovative Technologies
- Environmental Resource Protection
- Dredged Material Management
- Risk

DOER
Innovative Technologies

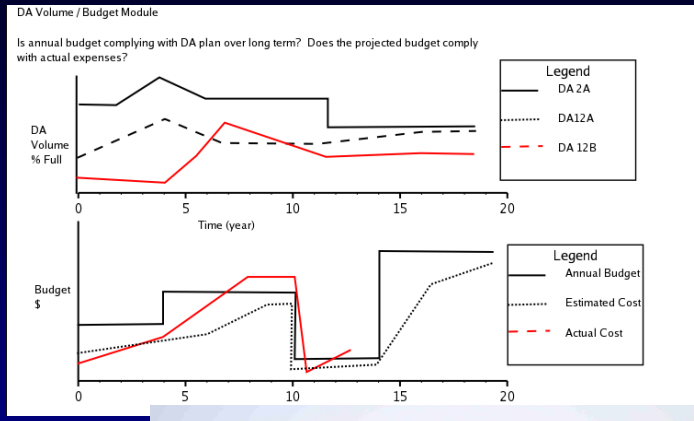
Identify, evaluate, and develop tools, databases and software, equipment, and techniques to improve the design, operation, and management of Corps-maintained navigation projects

Work Units

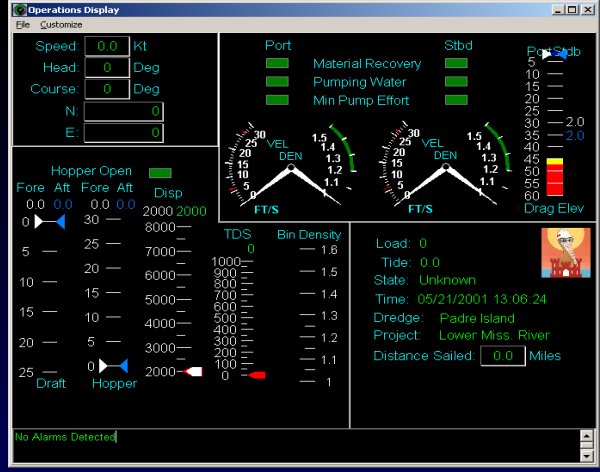
- **Evaluations and Cooperative Demonstration**
- **Dredging Project Management (Silent Inspector (SI))**
- **Dredging Operations Decision Support System (DODSS)**
- **Fluid Mud Measurement and the Definition of Navigable Depth**

Innovative Technologies Products for FY06

- Updated SI specs and mechanism for Corps-wide implementation
- SI for pipeline dredge demo
- Decision support application for Savannah King Island Turning Basin
- Evaluations on fluid mud survey systems
- Guidance on dredging in unexploded ordnance-contaminated sediment



Silent Inspector (SI)



- Corps-Wide Implementation in FY06
- Virtual Team
  - Operations in Mobile District
  - R & D – ERDC staff
- SI
  - 15+ years of development
  - R&D still needed to extend capabilities
    - Integrate TES, collect data on overdepth
    - Sophisticated data analysis
    - Synergy with other data: survey, environmental forcing, financial – through DODSS

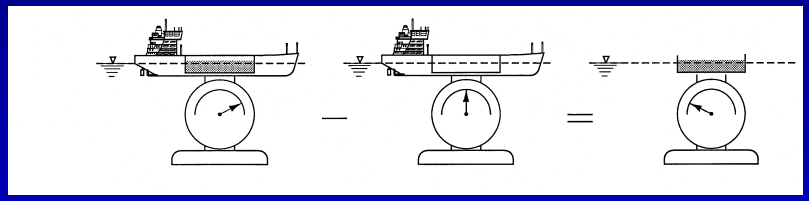
SI Research During Dredging Research Program (DRP)

- **DRP – 1988 - 1994**
  - **Developed Industry Partnership**
  - **Defined Requirements**
  - **Developed Basic Con**
  - **Prototype Field Tests**

DOER sponsored SI Research

(97- present)

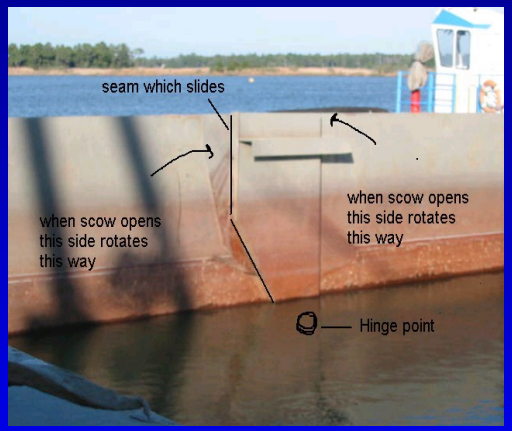
- **Refine SI Implementation for Hopper Dredges**
  - **Determine Sensor Accuracy**
  - **Refine QA Tests**
  - **Develop Procedures for TDS**
  - **Improve Data Transmission Equipment/Procedures**
  - **Expand/Improve database**
  - **Streamline Data Entry**
  - **Improve Contract Specifications – DPIP**



- **District Supported Development on Hopper Dredging Contracts since 1999**
  - **Mobile District**
  - **New Orleans District**
  - **Portland District**

Develop Scow/Mechanical Dredge Equipment/Procedures

- Specification/Profiles Developed
- SI scow initial implementat
  - Wilmington District
  - Sea

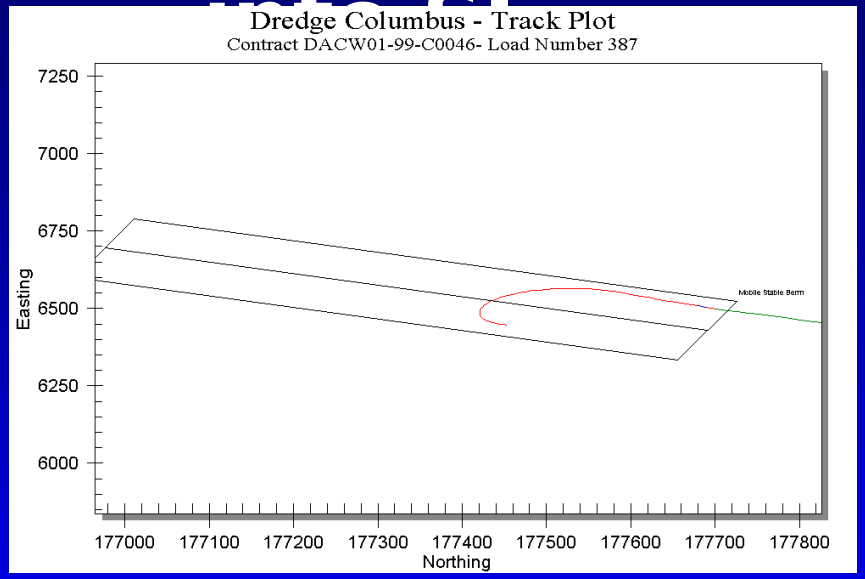


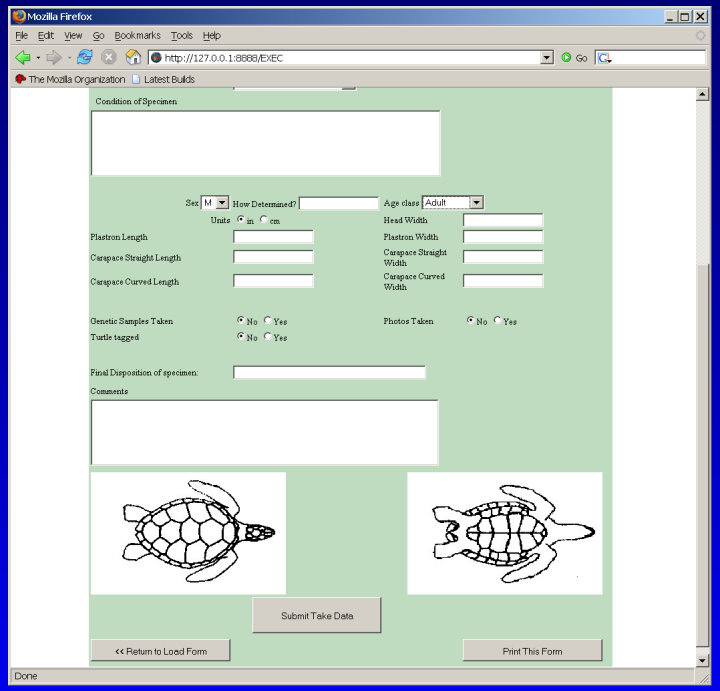
Develop Cuttersuction Dredge Equipment and Procedures

- **Initial Development**
  - **Dredge Thompson (99)**
- **Full Scale Test with Districts (06)**
  - **Rock Island/St. Paul (Dredge Goetz)**
  - **ict**

SI Research – EPA, TES

- EPA Requirements for Tracking Disposal Site Placement
- Incorporate TES observer forms into SI





DOER
Environmental Resource Protection

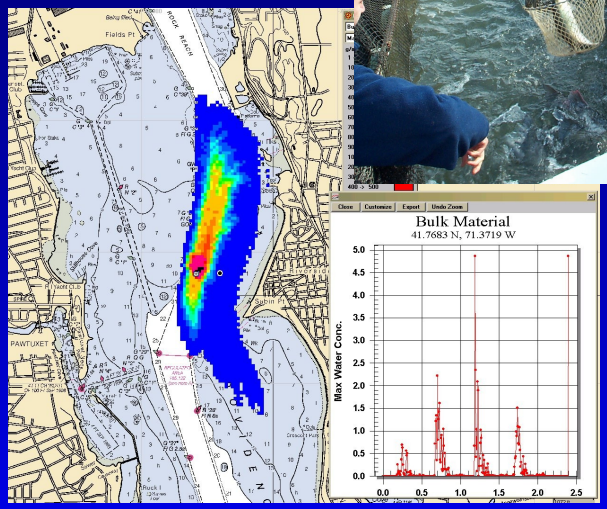
Address challenges associated environmental resource issues using a combination of innovative engineering and science

Work Units

- Threatened and Endangered Species Protection
- Habitat Protection
- Environmental Windows

Environmental Resource Protection
Top Products for FY 06

- Deploy on-line T&E species protection management system
- Publish validation of SSFATE far-field plume model
- Complete assessments of dredging effects on seagrasses and SAV
- New guidance on effective T&E bird protection measures

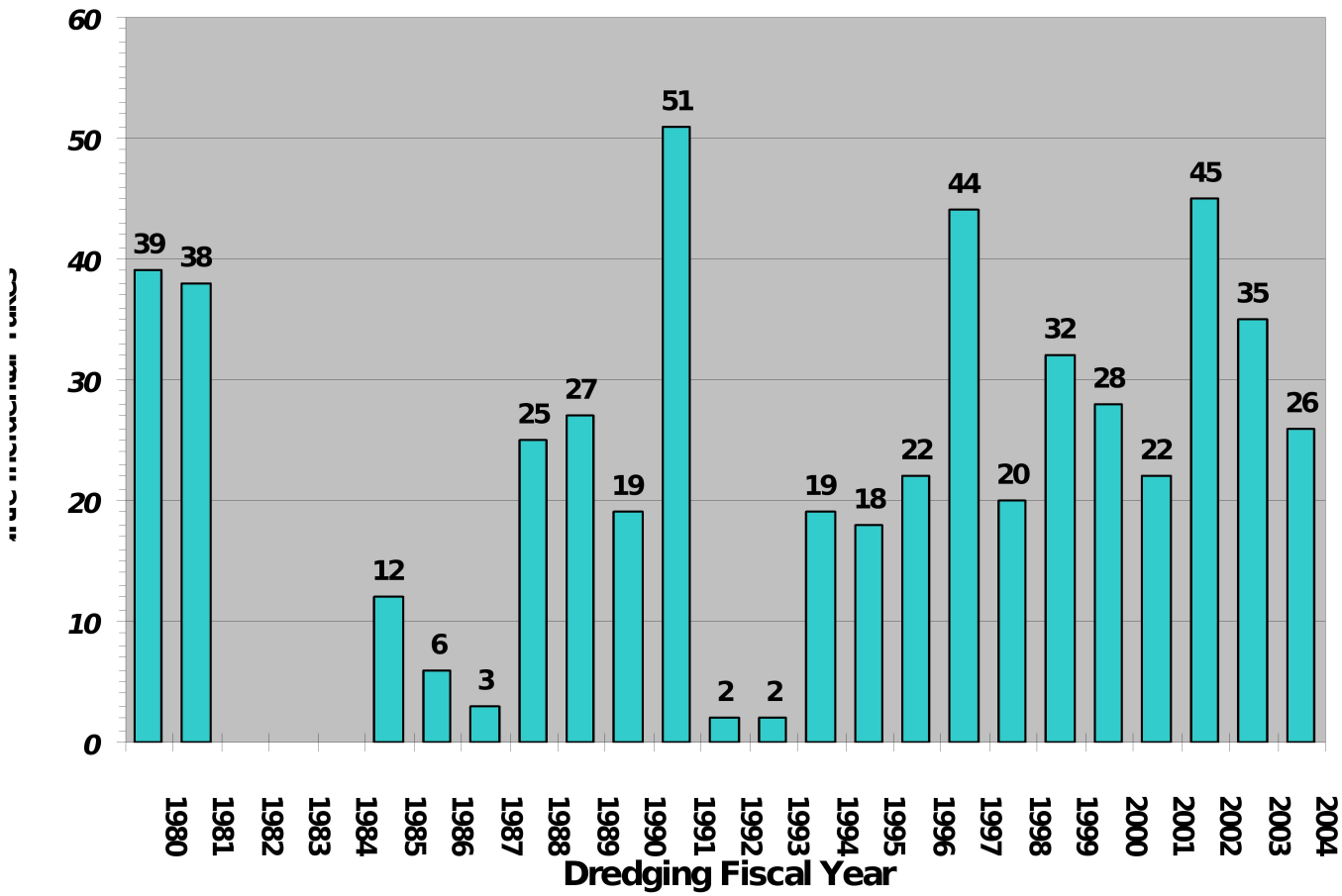


Sea Turtle Research in DOER

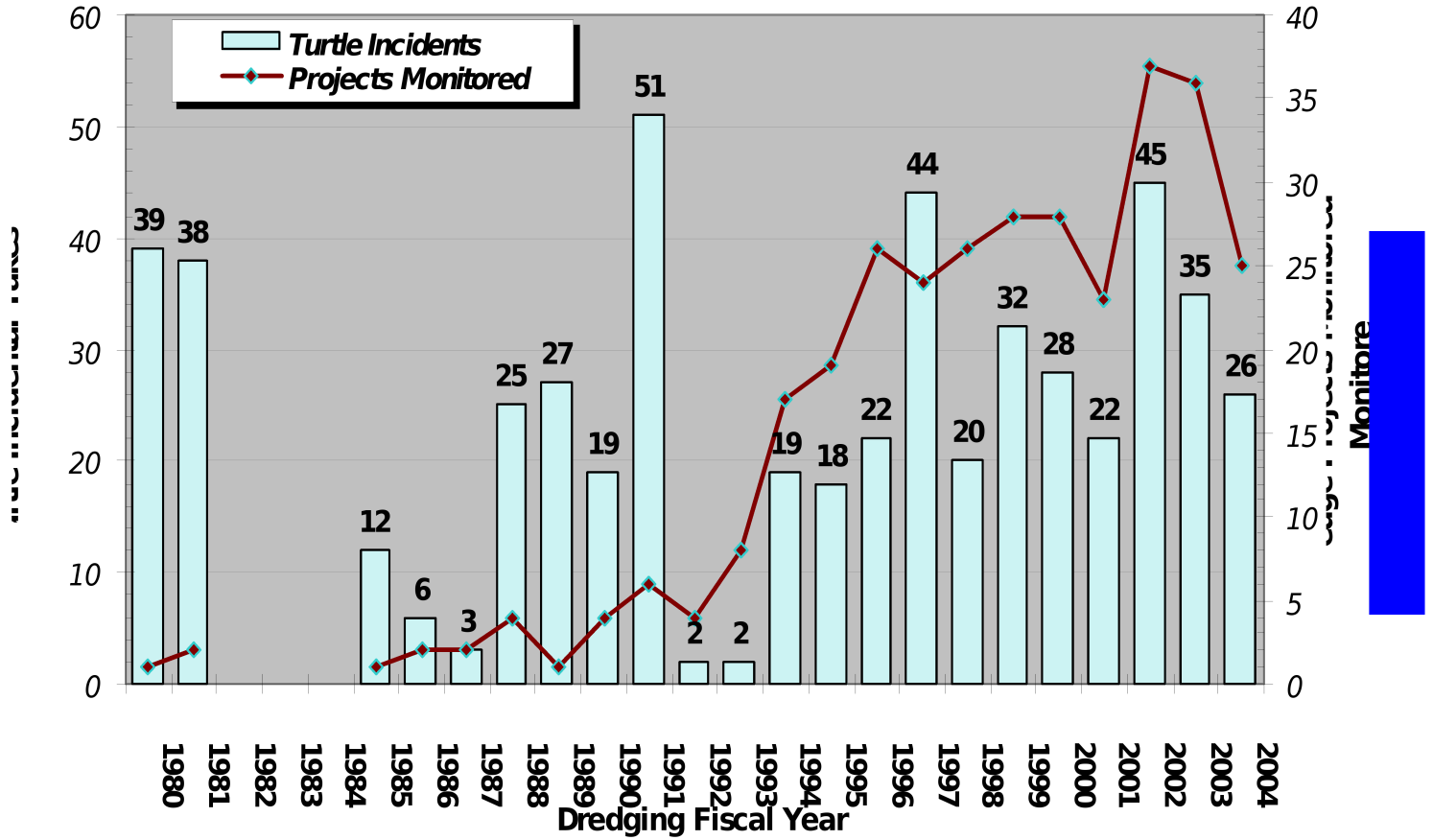
- Began in DOTS, Early 80s, observer program
- Sea Turtle Research Program 91-95
  - Engineering and Biology
- DOER
  - Collect and Analyze Take Data
  - Develop database and web sit
  - Electronic TES
  - Link to SI

http://el.erdc.usace.army.mil/seaturtles/

Annual Sea Turtle Takes
1980-2004

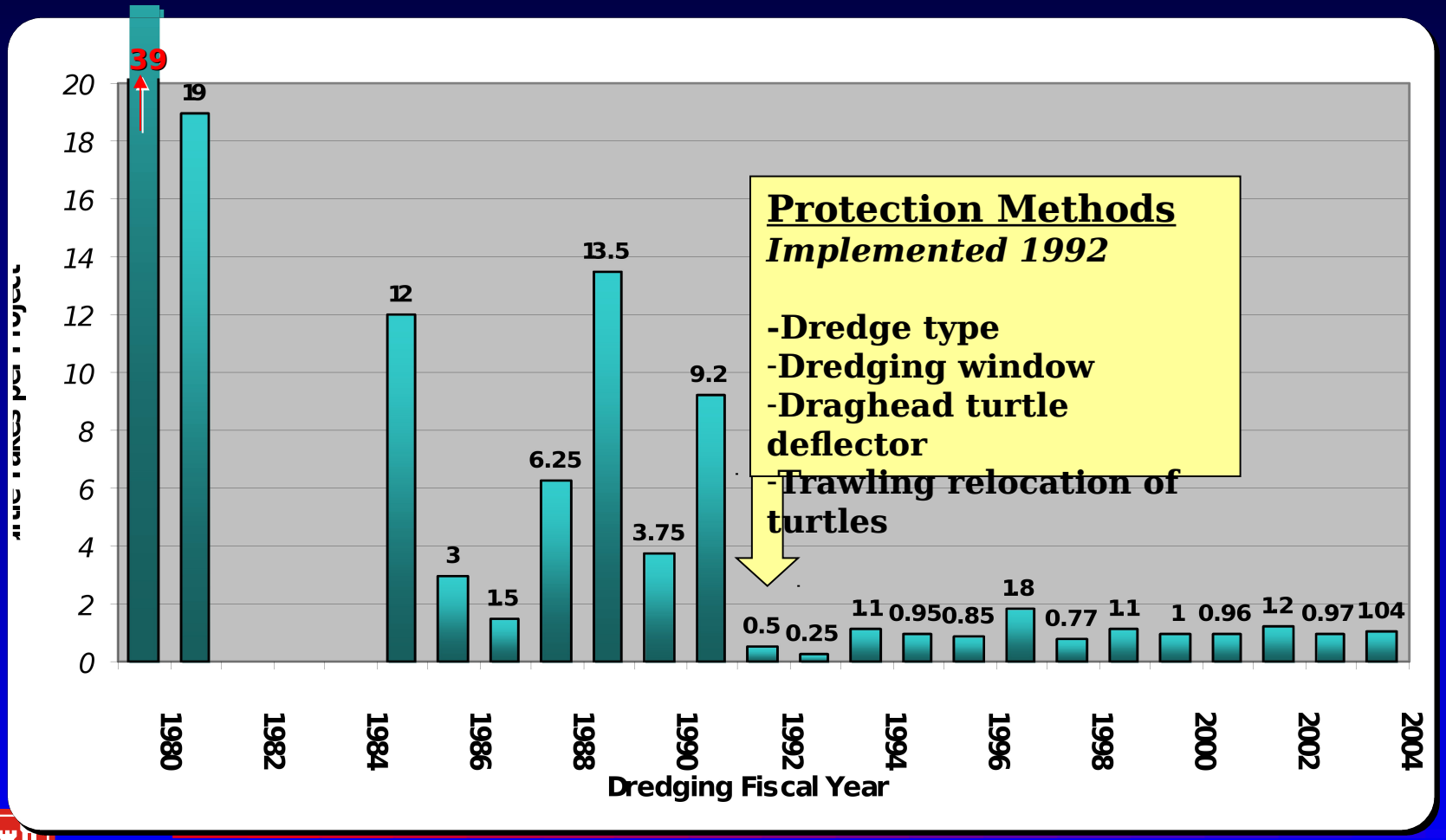


Annual Sea Turtle Takes and Dredge Projects Monitored *1980-2004*



Research and

Annual CPUE
Sea Turtle Takes per Monitored Projects
1980-2004



DOER Sea Turtle Research

- **Continue to populate/improve database**
  - **1.5 M hits/per year!**
  - **Improved communication w/ Corps, Industry, and resource agencies**
- **Allows more sophisticated analysis**
  - **Takes by dredge, location, per project, cy dredged, etc.**
  - **Helps Districts to know which dredges are more turtle friendly**
  - **Helps Districts/Contractor with “turtle swapping”**
- **Electronic version of TES forms (jointly with observers)**
- **Ultimately link with SI, auto population of database**
- **Different Regional Biological Opinions, makes reporting data challenging**

DOER

Dredged Material Management

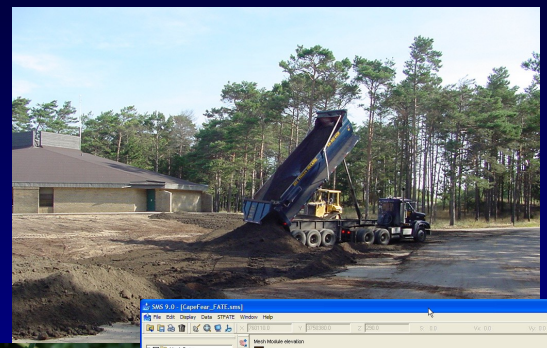
- Dredged material handling, transport, and placement options
  - operationally efficient, environmentally sound,
  - cost-effective

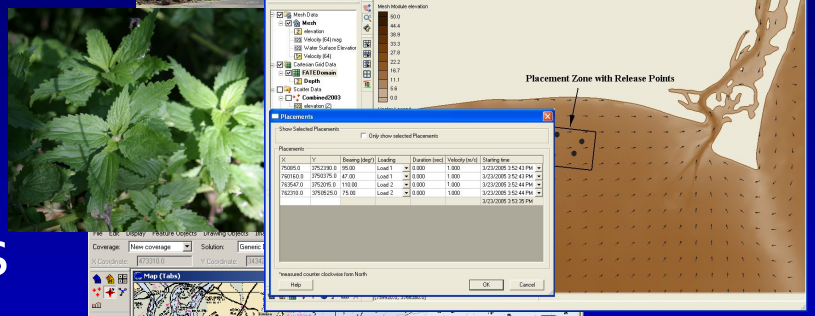
Work Units

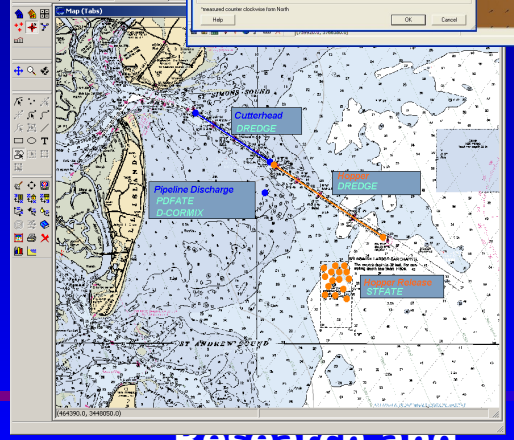
- Dredging Model, Data, and Project Interfaces
- Dredging and Aquatic Placement Operations and Management
- Confined Disposal Facility Placement, Management, and Reclamation

Dredged Material Management
Top Products for FY06

- PTM: Three-dimensional particle tracking model for dredge-induced suspended solids
- SMS Version 2 for near- and far-field dredging FATE models
- Mobile SEAWOLF flume for sediment suspension in wave-current environments
- Assessment tools for dredged material beneficial use suitability







DOER

Risk

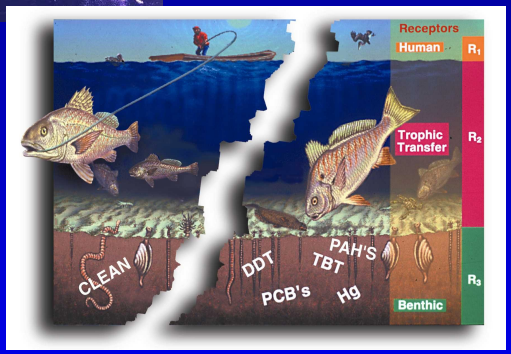
Develop and apply a comparative risk-based approach to the assessment and management of dredged material and develop logical decision support tools to manage uncertainty and facilitate efficient decision-making

Work Units

- **Exposure Assessment Methods and Approaches**
- **Effects Assessment Procedures and Tools**
- **Risk Characterization Approaches and Methods**

Risk Products for FY06

- Quantitative screening procedures for CDF contaminant pathway evaluations
- Volatile emissions assessment and modeling guidance
- FishRand-Migration bioaccumulation modeling software
- Framework for applying multi-criteria decision analysis in dredged material management



DOER Benefits

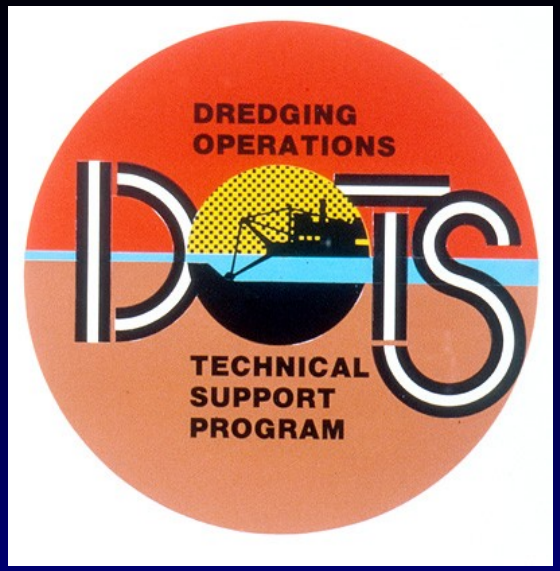
- Maintain viable aquatic placement alternatives
- Minimize risk to biological resources and their habitats
- Cost effective contaminated sediment management strategies
- Expanded beneficial use alternatives
- Improved information management
- Successful project management and contracting strategies
- Increase navigation dredging efficiency and production

Dredging Operations Technical Support Program (DOTS)

Since 1978

Dr. Doug Clarke

douglas.g.clarke@erdc.usace.army.mil



DOTS
FUNCTIONS

- Technology Transfer
  - Direct Technical Support
  - Training & Outreach
  - Technology Application

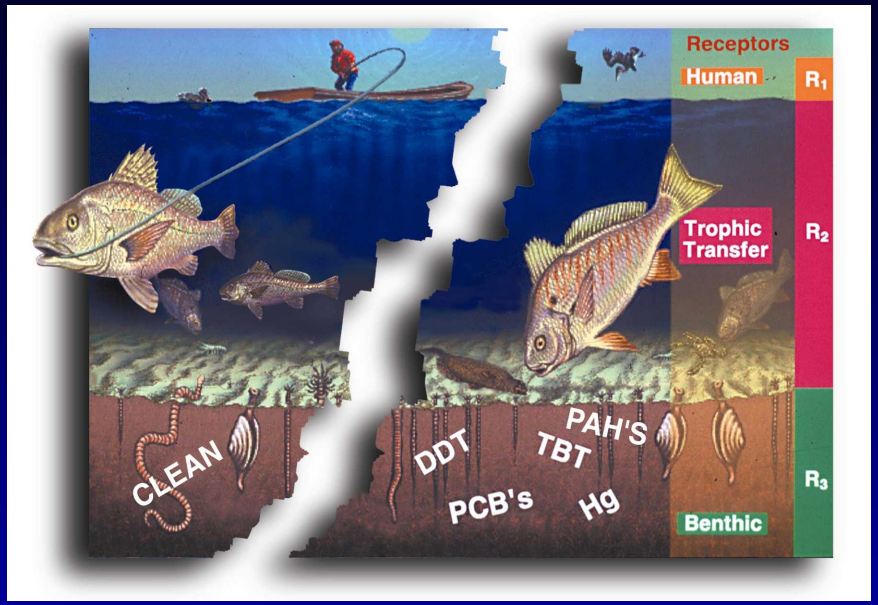
Dredging Operations
Technical Support Program
U.S. Army Corps of Engineers | Engineer Research & Development Center | Environmental Laboratory
DOTS
What's New
Research
Databases
Beneficial Uses of Dredged Material
Publications
Guidance Documents
Models
Center for Contaminted Sediments
Expertise/Contacts /Research Teams
Training
Dredging Resources
Education Center
Related Sites
ACCORD
Program Manager: Dr. Douglas Clarke
Program Monitor: Mr. Joseph Wilson
The Dredging Operations Technical Support Program, known as DOTS, provides direct environmental and engineering technical support to the U.S. Army Corps of Engineers Operations and Maintenance (O&M) dredging mission. Technology transfer activities have supported diverse field needs for years and have directly benefited O&M dredging operations throughout the United States.
Take a Trip Through a Dredge!
Search

500K + hits per year

http://el.erdc.usace.army.mil/dots

DOER and DOTS

- The power of combining:
  - Advanced science and engineering
  - Technology transfer
- Sensible methods for quantifying risks and uncertainties
- Sound and cost efficient engineering technologies for managing risks and uncertainties
- Structured and defensible methods for guiding decision making



QUESTIONS